CHAPTER - IV

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4.1 IRRIGATION DEVELOPMENT IN INDIA

4.1.1 Introduction

Irrigation is the artificial application of water to soil usually for assisting in growing crops. It is critical, yet a vital input of agriculture production process and pivotal to agriculture, social and economic growth of nation. Civilization has been dependent on development of irrigated agriculture to provide agrarian basis of a society to enhance security of people. Along with bless irrigation also brought the inherent attachments of several problems like salinity and water logging. Civilizations have risen and fallen with the growth and decline of their irrigation systems, while others have maintained sustainable irrigation for thousands of years. Understanding history of irrigation development helps in augmenting knowledge about the traditional system many of which are equally relevant in today’s context.

4.1.2 Meaning of Irrigation

It is seldom clearly defined irrigation as a frequent and regular application of water there are various definitions is vogue defining the term “irrigation”

According to Wiesnar: Irrigation is the practice of applying water to the soil to supplement the natural rainfall and provide moisture for plant growth

Better in the irrigated and non-Irrigated lands, moisture conservation play very important role, on the part of tropical cultivation strategies Irrigation development has had greater attention from researchers and much more finding out in future money and must be directed towards optimizing the use of natural precipitation, and where irrigation is practiced to reduce the demand for water so that supplies are less likely to fail. Enabling greater area of crops to be grown

Irrigation can be classified into three groups they are

1) Major, Medium & Minor irrigation.

2) Sprinkler Irrigation.

3) Drip Irrigation.
By the source of water, we can produce more food and non-food crops in a scientific way.

Irrigation plays very important role in economic development of India. For the economic development we need capital, and capital broadly defined as all assets, physical, human, social and institutional, that create income and contribute to human welfare. Agricultural development is now generally recognized as an integral part of overall economic development. Not only the physical capital develop our economy but also some of the social and institutional change that enhance human welfare.

“Indian agriculture is gambling with monsoon rains” therefore, nobody can neglect the importance of irrigation in an agriculture country like India. If rainfall is regular and sufficient then the farming totally dependent upon rainfall But in India rainfall is uncertain. In India we give more importance for agriculture because of major portion of the national income is being derived from agriculture. Agriculture is failure in the all round economy. If the agriculture sector goes down, the supply of the food and cash crops, raw materials are also grown. The industries suffer because lack of demand and scarcity of materials. And nothing can be done immediately to boost up agricultural produce.

Rainfall is the natural source of water for agricultural practices. Agricultural development mainly depends on two basic factors which are soil and water. Deep black soil which holds moisture for a period long enough to promote plant growth limited.

Indian agriculture depends on uncertain and regular monsoons. Monsoons distributed unevenly throughout the year. In some areas we saw heavy rainfall and some areas scanty. Heavy rainfall creates the problem of soil erosion and food damages. In scanty rainfall areas, there is an acute shortage of water for agriculture.

Water shortage for agriculture is also one of the main reasons for improper or unbalanced cropping pattern. Uplift or balance of cropping pattern is the focal point of our plan strategy water wastage in heavy rainfall areas, and water shortage, elsewhere draw our attention to the urgent need of the creating proper and adequate irrigation facilities for overall agricultural development.
Regular water supply is more needful for agricultural because dependable sources of water can be had from irrigation facilities alone. Irrigation brings about a drastic change in the soil. These facilities the use of manure which gives high yield Double and tribal cropping and introduction of cash crops bring not only stability to agriculture but also crate surplus in the economy. By this surplus production of food crops and commercial crops, we can solve the problems of food and income.

“If the monsoon fails, there will be lockout in agricultural industry” remarked Wolff. Therefore “Indian budget is gamble of rains”. Sir Charles Trevelyan says “Irrigation is everything in India; water is even more valuable than land, because when water is applied to land automatically it increase the productiveness at least six fold. These all remarks bring out the importance of irrigation in economic development.

Irrigation is very needful for developing country like our India. Irrigation is one of the oldest and newest topics in the history of world agriculture. Today it is one of the dynamic factor in world agricultural development irrigation encourages or facilities to produce double or tribal crops a year. It will indirectly supports to demand for more labor, intensive, work opportunities for these people.

The need for providing irrigation facilities to all villages cannot be emphasized too greatly. This is the foundation upon the agriculture, depends for its progress, in the absence of which it remains a gamble, wrote Mahatma Gandhi in 1946 just before independence.

Dr. Knowles writes “The irrigation works have made security of life they have increased the yields, and value of the land and revenue derived from it. They have lessened the cost of famine relief and have helped to civilize the whole region. in addition , they had some profits to the government.

4.1.3 History of Irrigation Development Under British Rule

Irrigation development under British rule began with the renovation, improvement and extension of existing works, when enough experience and confidence had been gained, the Government ventured on new major works, like the
upper Ganga canal, the upper Doab canal and krishna and Godavari Delta systems, which were all river diversion works of considerable size. The period from 1836 to 1866 marked the investigation, development and completion of these four major works. In 1867, the Government adopted the practice of taking up works, which promised a minimum net return. Thereafter, a number of projects were taken up. These include major canal works like the Sirhind, the lower Ganga, the Agra and the Mutha canals, and the Periyar Dam and canals. Some other major canal projects were also completed on the Indus system during the period. These included the Para, the lower Chenab and the Sidhnai canals, all of which went to Pakistan in 1947.

The recurrence of drought and famines during the second half of the 19th century necessitated the development of irrigation to give protection against.

4.1.4 Irrigation Development Under Plans

In India, agriculture is at the mercy of timely rains. But the rainfall in the country is highly irregular, uncertain and erratic. Consequently droughts and floods have become most common, so irrigation is life blood for agriculture. Agriculture is the backbone of Indian economy to make it strong and longstanding; government has taken many steps and implemented programmes since independence. Each plan beginning with first plan in 1950-51 to twelfth plan of today, listed the basic objective of India’s development. This objective acted as guiding principles for Indian Planning.

After independence the country was facing the problem of food & raw material. For both the problems the government has invented one solution that is of developing agriculture. For building up of agriculture sector the high priority was given to irrigation in first five year plan.

First Five Year Plan (1951-56)

It is attempted to stimulate balance of economic development while correcting imbalance caused by the failure of crops and to reduce large scale expenditure on famine relief. As irrigation works in low rainfall tracts were not considered likely to meet the productivity test, they had to be financed from current revenues. Significant
protective works constructed during the period were the Betwa canal, the Nira left Bank canal, the Gokak canal, the Khaswad tank and the Rusikulya canal. Between the two types of works, namely productive and protective, the farmer received greater attention from government. The gross area irrigated in British India by the public works at the close of the 19th century was about 7.5 m.ha of this 4.5 m.ha came from minor works, like tanks, inundation canals etc. for which no separate capital account were maintained. The area irrigated area under British rule was only 7.85 m.ha. Agriculture was completely neglected by Britishers; they have concentrated only on exploiting countries natural resources.

World war-II and partition In first plan, the first priority was given to the projects that combined irrigation and power generation about 4500 million was spent on irrigation, the plan has taken up 44 major irrigation and 169 medium irrigation projects. During this plan irrigation has attained its peak in terms of investment.

**Second Five Year Plan-(1956-61)**

More emphasis on industrialization basic and heavy industries have given high priority under the second plan. The development of irrigation is neglected in second five year plan.

**Third Five Year Plan (1961-66)**

Rectifying the mistakes of second five year plan more intensives were given to agriculture and irrigation development under 3rd plan. By this it has given push to agriculture and country attained self-sufficient in food production in mid-1960. Economic difficulties disrupted planning process, plan holiday declared because of brief war between china, Pakistan and India in 1963 causing acute shortage in food grains. There was a sharp increase in defense expenditure and other public expenditure was cut off.
Fourth Five Year Plan (1969-74)

The fourth plan has spent 23% of its total outlay on agriculture and irrigation development. Government wants to increase the level of food grain by pushing up agriculture sector. Scientific temper to Indian agriculture and self-reliance in food production was brought under this plan.

Fifth Five Year Plan (1974-78)

A new non congress government came to power; the plan has not completed its full term. Because of increase in crude oil prices, economy was adversely affected. No much concentration given to irrigation in this plan period.

Sixth Five Year Plan (1980-85)

The 6th plan was flexible one, and based on annul rolling plans originally plan was launched by Janata Govt. and competed by new Govt. The main objective of this plan is eradication of poverty. More stress was given to poverty alleviation programmes.

Seventh Five Year Plan (1985-90)

More emphasis on allocation of resource to energy and social spending more expenditure on agriculture, industry and transport Infrastructure development was given priority. Food, work and employment were given basic priority.

Eighth Five Year Plan (1991-97)

The plan has cut back the public ceiling and secured priority was given to agriculture and rural development. The government was much eager to welcome the new economic policy and to open itself for rest of the world. Objectives of faster growth in economic and manufacturing sector.

India was following social democratic based policies from 1947 to 1991. In 1990’s following economic reforms from developed economy the country has adopted the open economic policy. The liberalization, Globalization and privatization have become the base for economy.
Ninth Five Year Plan (1997-2002)

Form this plan government started spending not only on irrigation but also on flood control. Along with irrigation, concentration was given to agriculture and growth rate in economy.

Tenth Five Year Plan (2002-07)

In this plan to improve efficiency, irrigation projects should be benchmarked for performance evaluation by an independent expert group so that optimum use of water is realized. Renovation and restoration of old tanks as well as old diversion channels in hilly regions be given high priority. Micro irrigation system in water deficit is promoted.

Local storage is cast effective. There is significant potential for increasing the overall utilizable water through rain water harvesting, construction of check dams; water shed management, and restoration of traditional water bodies as well as creation of new ones. In areas where ground is under severe stress artificial recharging would need to be undertaken with proper technical support.

Eleventh Five Year Plan (2007-12)

The eleventh plan has underlined the sad reality that some of the projects started in pre-fifth plan and fifth plan periods had not yet been completed. Two decades is too long a period for the completion of a project. This was a sad reflection on our planning process. Therefore, there was the need to undertake only a few new major and medium project and emphasis should be laid on the completion of ongoing projects as a first charge on the available resources.

As against an investment of Rs.1, 09,025 crores on irrigation and flood control in the Tenth plan, eleventh plan proposed an outlay of Rs.2, 32,310 crores on irrigation and flood control in the public sector.

The working group for the eleventh plan has assessed that a total at 161 major and 222 medium irrigation projects would spill over into Tenth plan from the previous-known as extension, Renovation and Modernization (ERM) projects would also spill over to the eleventh plan. A further 278 major 143 medium and 86 ERM projects would also be taken up during the eleventh plan. For completing the old
projects and executing new projects, the eleventh plan proposed a total outlay of Rs 2,32,310 crores and hopes create over 11 million hectares of additional irrigation potential.

4.1.5 Plan-Wise Major and Medium Irrigation Schemes

The development of irrigation received high priority in successive plans and many new irrigation projects were taken up to create food security in India. A number of major and medium irrigation projects were taken up consuming a bulk of the investment under public sector. The overall outlay for irrigation increased quite substantially over different plan periods of second five year plan (1956-61) third five year plan (1961-66) and the three annual plans (1966-69), irrigation programmes were being implemented with new starts. During the fourth five year plan 1969-74), the emphasis was shifted to the completion of ongoing project integrated use of surface and ground water, adopting of efficient management techniques and modernization of exiting schemes, apart from continuation of new starts. During the fifth plan (1974-78) command area development programme was launched as a centrally sponsored scheme with the objective of reducing the lag between potential created and optimum utilization of available land and water. The programme was conceived as a means of co-coordinating all related farm activities under one. Initially, 60 major and medium projects were covered with CCA of 15 Mh.

During the Annual plans of 1978-80 and the sixth five year plan (1980-85), ‘new starts’ continued and at the end of seventh plan, there were as many as 182 major and 312 medium ongoing projects required as estimated amount of Rs 39, 044 crores at the 1990-91 price level for their completion. ‘New Starts” were therefore restricted considerably and greater emphasis laid on completion of projects, which were in the advance stages of completion (those with an expenditure of 75 percent or more). This was continued during 1990-91 & 1991-92 annual plans, as well as during viii plan (1992-97) IXth plan (1997-2002) and Xth plan (2002-07), XIth plan (2007-12).
4.2 IRRIGATION DEVELOPMENT IN KARNATAKA

Agriculture plays a dominant role even in Karnataka. The state is situated in southern part if India, with geographical area of (19-04 mha) two-third of the state receives less than 700 mm of annual rainfall. Sate has 60 % (114 lakh hec) of cultivated land in that 72% of cultivable land is rain fed. There is only 28% land is irrigated; therefore most part of state is always under threat of drought. The government of Karnataka has given considerable attention towards the development of irrigation. So the mounting importance of irrigation has led both the country and the state to take up irrigation projects to ensure sufficient water to the agriculture land.

Water is becoming a scarce commodity which is needs of urban and rural population. Economic progress of state is intricately and inseparably related to the management of its scarce water resources, use of its adequate quantity at right place and at regular intervals. Water also plays a very crucial role in agriculture. Irrigation is control in augmenting agriculture production.

Table No. 4.2
Trends in Irrigation Area in Karnataka

<table>
<thead>
<tr>
<th>Year</th>
<th>Net area shown</th>
<th>Grossed Cropped area</th>
<th>Gross Irrigation Area</th>
<th>Net Cropped Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61</td>
<td>10228</td>
<td>10588</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1970-71</td>
<td>10248</td>
<td>10887</td>
<td>1355</td>
<td>12.45</td>
</tr>
<tr>
<td>1980-81</td>
<td>9899</td>
<td>10660</td>
<td>1676</td>
<td>15.72</td>
</tr>
<tr>
<td>1990-91</td>
<td>10381</td>
<td>11759</td>
<td>2598</td>
<td>22.09</td>
</tr>
<tr>
<td>2000-01</td>
<td>10410</td>
<td>12284</td>
<td>3271</td>
<td>26.63</td>
</tr>
<tr>
<td>2011-12</td>
<td>10404</td>
<td>12873</td>
<td>4096</td>
<td>31.82</td>
</tr>
<tr>
<td>2012-13</td>
<td>10523</td>
<td>13062</td>
<td>4278</td>
<td>32.75</td>
</tr>
</tbody>
</table>

Above table shows that there has been a gradual increase in the gross irrigated area in the state the gross irrigated area has increased steadily from 1980-81 to 32 percent the total irrigated are has reached up to 4278 (in lakh hectares).

Figure No. 4.2
Trends in Irrigation Area in Karnataka Net Area Sown
Figure No. 4.3
Trends in Irrigation Area in Karnataka Gross Cropped Area

Figure No. 4.4
Trends in Irrigation Area in Karnataka Gross Irrigated Area
4.2.1 Irrigation Potential Created Through Major, Medium and Minor Irrigation Projects

The cumulative irrigation potential likely to be created under major, medium & minor irrigation (only surface water) up to the end of 2010-11 is 35.12 lakh hectares, as against an estimated total irrigation potential of 45 lakh hectares comprising of 35 lakh hectares under major & medium irrigation and 10 lakh hectares under minor irrigation. An additional irrigation potential of 0.59 lakh hectares is anticipated during the current year (2010-11) through major & medium irrigation projects, consisting of 0.47 lakh hectares under plan projects and 0.12 lakh hectares under projects pending approval. Through the Upper Krishna project alone, a potential of 0.17 lakh hectares is anticipated in 2010-11. Under minor irrigation (surface water), the additional potential, which will be created this year, is 0.10 lakh hectares from the three categories.
Table No. 4.3
Irrigation Potential Created by Source 2010-13 (Lakh in hectares)

<table>
<thead>
<tr>
<th>Source</th>
<th>2009-10</th>
<th>2011-12</th>
<th>2012-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major &amp; medium</td>
<td>24.28</td>
<td>24.56</td>
<td>25.15</td>
</tr>
<tr>
<td>Irrigation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Irrigation</td>
<td>9.81</td>
<td>9.87</td>
<td>9.97</td>
</tr>
<tr>
<td>Total</td>
<td>34.09</td>
<td>34.43</td>
<td>35.12</td>
</tr>
</tbody>
</table>


The cumulative irrigation potential under major, medium and minor irrigation (Surface water) is increased to go up to 35.12 lakh hectares (excluding ground water) in 2011-12 from 34.43 lakh hectares in 2012-13 35.12.

Figure No. 4.6
Irrigation Potential Created by Source 2010-13
4.2.3 Expenditure Incurred on Major and Medium Irrigation Projects

Expenditure on major and medium irrigation projects was Rs.3163.41 Crore for plan and projects pending approval together in 2009-10. The corresponding expenditure in 2010-11 is Rs.3480.47 Crore. Expenditure incurred up to the end of December 2010 was Rs.1554.44 Crore for Plan projects and Rs. 304.39 Crore for projects pending approval. The expenditure on Upper Krishna Project alone, up to end of December 2010 is Rs. 426.09 Crore.

The latest revised estimated cost for Upper Krishna project, Stage I is Rs.3959.80 Crore & Upper Krishna Project Stage II is Rs.6891.59 Crore and the total Upper Krishna Project is Rs.10851.39 Crore. As per Planning Commission approval dated 22.1.2009, the cumulative expenditure up to end of March 2010 on Upper Krishna Project. Stages I & II was Rs.10267.93 Crore. The anticipated expenditure in 2010-11 for the Upper Krishna Project alone accounts for Rs.583.46 Crore. The Stage I Phase –III and Stage-II works are nearing completion.

The works in UKP are nearing completion. It has been planned to irrigate about 6.22 lakh hectares of land falling under the drought prone districts of Bijapur, Bagalkot, Gulbarga and Raichur. As on September 2010 an outlet potential of 6024473 Ha has been achieved

KBJNL has undertaken construction of five barrages across river Bhima to utilize 9TMC of water. Already construction of five barrages viz. Ghattarga barrage, Kallur‘B’ barrage, Yadgir barrage and Joladagi – Gudur barrages are completed and water is stored and utilized. In respect of Sonthi barrage to utilize 4 TMC of water, construction of modified scope of civil work of barrage, providing gates, lifting system work on turnkey basis etc., is in progress.
Table No. 4.4
Plan Allocation on Irrigation Sector
(Rs in crores)

<table>
<thead>
<tr>
<th>Year</th>
<th>Allocation</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>1613.52</td>
<td>1297.55</td>
</tr>
<tr>
<td>2003-04</td>
<td>1897.14</td>
<td>1178.59</td>
</tr>
<tr>
<td>2004-05</td>
<td>2041.68</td>
<td>1305.58</td>
</tr>
<tr>
<td>2005-06</td>
<td>2856.63</td>
<td>1696.30</td>
</tr>
<tr>
<td>2006-07</td>
<td>3224.54</td>
<td>2106.86</td>
</tr>
<tr>
<td>2007-08</td>
<td>2396.77</td>
<td>2209.90</td>
</tr>
<tr>
<td>2008-09</td>
<td>2857.48</td>
<td>2101.02</td>
</tr>
<tr>
<td>2009-10</td>
<td>3144.08</td>
<td>2787.62</td>
</tr>
<tr>
<td>2010-11</td>
<td>3608.70</td>
<td>1858.88</td>
</tr>
</tbody>
</table>

Source: Water Resources Department, Government of Karnataka 2012 p.119

The table explains four works namely Jeerigehal, Manikeshwar, Halhalla and Chandapuraanicut have been taken up across Manjra River in Bidar district to utilize 4.8 TMC of water. Civil works are in progress. The Narayanapur&Almatti dams have been completed. Almatti dam (Sri LalbahadurShastriSagar) was dedicated to the nation by the President of India on during 2010-11, a potential of 17,500 hectares is anticipated to be created as against the contemplated irrigation potential of 6.22 lakh hectares under the Upper Krishna Project, Stage I and II.
Table No. 4.5
Details of Major Canal Network under Upper Krishna Project

<table>
<thead>
<tr>
<th>Component of work</th>
<th>Length in (km)</th>
<th>Planned Irrigation command (in ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narayanpur left bank canal</td>
<td>78</td>
<td>47,223</td>
</tr>
<tr>
<td>Shahapur Branch canal</td>
<td>76</td>
<td>1,22,120</td>
</tr>
<tr>
<td>Mudhebal Branch Canal</td>
<td>50.8</td>
<td>51,000</td>
</tr>
<tr>
<td>Indi Branch Canal</td>
<td>172</td>
<td>1,31,260</td>
</tr>
<tr>
<td>Jewargi Branch Canal</td>
<td>86.36</td>
<td>57,100</td>
</tr>
<tr>
<td>Almatti left bank canal</td>
<td>85</td>
<td>20,235</td>
</tr>
<tr>
<td>Narayanpur Right bank canal</td>
<td>95</td>
<td>84,000</td>
</tr>
<tr>
<td>Almatti Right bank canal</td>
<td>67.5</td>
<td>16,100</td>
</tr>
<tr>
<td>Mulwad LIS</td>
<td>95.4</td>
<td>30,850</td>
</tr>
<tr>
<td>Rampur LIS</td>
<td>51.5</td>
<td>20,235</td>
</tr>
<tr>
<td>Indi LIS</td>
<td>96</td>
<td>41,900</td>
</tr>
</tbody>
</table>

Source: Water Resources Department, Government of karnataka2012, p.77
Figure No. 4.7
Details of Major Canal Network under Upper Krishna Project

Figure No. 4.8
Details of Major Canal Network under Upper Krishna Project

Planned Irrigation command (in ha)

- Narayanpur left: 47,223
- Shahapur Branch: 12,212
- Mudhebal Branch: 5,100
- Indi Branch Canal: 13,126
- Jawari Branch: 5,710
- Almatti left bank: 2,023
- Almatti Right bank: 8,400
- Mulload LIs: 16,100
- Rampur LIs: 30,850
- Indi LIs: 2,023
- Indi LIs: 4,190

Length in (km)

- Narayanpur left: 78
- Shahapur Branch: 76
- Mudhebal Branch: 50.8
- Indi Branch Canal: 172
- Jawari Branch: 86.36
- Almatti left bank: 85
- Almatti Right bank: 95
- Mulload LIs: 67.5
- Rampur LIs: 95.4
- Indi LIs: 51.5
- Indi LIs: 96
4.2.4 Accelerated Irrigation Benefit Programme (AIBP)

In Upper Krishna Project For early completion of some of the ongoing irrigation projects, which were lingering due to shortage of funds for many years, the Government of India launched the Accelerated Irrigation Benefit Programme, during 1996-97. Since then, 11 Projects in the state, namely, Upper Krishna Project (UKP) Stage-I, Phase-III, Malaprabha, Varahi, Bhima LIS, Guddadamallapura LIS and Gandhorinala have received / are receiving Central Loan Assistance (CLA) under Accelerated Irrigation Benefit Programme.

- During 1996-97, at the end of 8th Five Year Plan, Government of India launched the Accelerated Irrigation Benefit Programme with the intention of completing those projects lingering due to shortage of funds. From 1996-97 to 2002-03, the sharing between the centre and the state was in the ratio of 50:50. Since 2002-03, the sharing is in the ratio of 2/3:1/3.

- During 2009-10, UKP Stage I, Phase III, UKP Stage II, Malaprabha, Ghataprabha, Karanja, Gandorinala, Varahi, Bhima LIS and Guddadamallapura LIS are the 9 projects that have received / are receiving C.L.A. under A.I.B.P.

- The cumulative C.L.A. (including grants) released up to end of March 2010 is Rs. 4,116.05 Crore. The cumulative expenditure incurred on these projects up to the end of March 2010 is Rs. 5569.78 Crore.

- During 2004-05, loans along with grants were released to the projects in the ratio of 70:30.

- The Central Assistance released, during 2009-10 for 9 projects namely UKP Stage I Phase III, UKP Stage II, Malaprabha, Ghataprabha-III, Gandorinala, Karanja, Bhima LIS (new), Guddadamallapura LIS (new) and Varahi is Rs.549.75 Crore.

- The expenditure incurred on these 8 projects during 2010-11 up to end of March 2010 is Rs. 399.68 Crore.
8 Major & Medium Irrigation Projects under AIBP and 3 projects under Prime Minister’s Special Package have been proposed for Central Assistance.
Expenditure incurred till December 2010 is Rs. 456.65.

4.2.5 Special Development Programme (SDP)

For the completion of projects State Government is committed to eradicate regional imbalance by implementing the recommendation of Dr. Nanjundappa Committee Report. For completion of on-going major and medium irrigation projects in backward, more backward and most backward areas, budget allocation of Rs.302.80 Crore was made during 2008-09. Financial Progress of Rs.289.41 Crore (96 percent) has been achieved. During 2009-10 financial progress of Rs.314.19 Crore was achieved against budget provision of Rs. 310.00 Crore (as per the revised guidelines). Budget allocation for the year 2010-11 is Rs. 328.83 Crore, expenditure incurred till December 2010 is Rs. 256.05 Crore and 3325 hectares of irrigation potential is achieved.

4.2.6 Cropping Pattern

In the state there has been steady increase in area of paddy, maize, pulses, sugarcane and tobacco. Paddy area increased from 10.28 lakh hectares in 1960-61 to 15.14 lakh hectares. 2011-12. Maize area increased from just 11,000 hectares to 12.87 lakh hectares during the same time period. Red gram and Bengal gram have reached 8.83 and 9.85 lakh hectares from 2.96 and 1.58 lakh hectares, respectively in 1960-61. Area of pulses has doubled from 13.06 lakh hectares to 28.31 lakh hectares. Oilseed area also witnessed a steady increase up to1993-94 when it reached to 31.27 lakh hectares. Oilseed area declined in successive years and touched 17.37 lakh hectares in 2011-12. However, it again increased up to 2005-06 with the introduction of special programmes. There has been steady decline in area under oilseeds from 2006-07 onwards. During current year area coverage under maize, pulses (mainly under Redgram&Bengalgram) and cotton was higher than the normal and targeted area on account of better market prices and favorable climatic conditions.
Table No. 4.6
Crop Wise Certified Seed Production during 2010-11 to 2012-13
(In metric tonne)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paddy</td>
<td>28,978.00</td>
<td>23,048.87</td>
<td>30,178.00</td>
<td>24,579.50</td>
<td>35,609.50</td>
<td>23,568.50</td>
</tr>
<tr>
<td>2</td>
<td>Ragi</td>
<td>2,520.00</td>
<td>1,413.72</td>
<td>2,557.50</td>
<td>999.94</td>
<td>3,452.00</td>
<td>956.8</td>
</tr>
<tr>
<td>3</td>
<td>Maize</td>
<td>2,568.50</td>
<td>4,508.81</td>
<td>2,845.60</td>
<td>2,299.79</td>
<td>20,700.00</td>
<td>1,854.60</td>
</tr>
<tr>
<td>4</td>
<td>Bajra</td>
<td>125.00</td>
<td>99.706</td>
<td>112.5</td>
<td>80.805</td>
<td>125.6</td>
<td>92.5</td>
</tr>
<tr>
<td>5</td>
<td>Wheat</td>
<td>3,025.00</td>
<td>1,338.47</td>
<td>3162.5</td>
<td>1,796.86</td>
<td>3,982.50</td>
<td>1,254.60</td>
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<tr>
<td>6</td>
<td>Jowar</td>
<td>2,256.80</td>
<td>2,018.71</td>
<td>2,654.80</td>
<td>3,203.20</td>
<td>3,060.00</td>
<td>2,854.80</td>
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<td>Cereals Total</td>
<td>39,473.300</td>
<td>32,428.286</td>
<td>41,510.900</td>
<td>32,960.095</td>
<td>66,929.600</td>
<td>30,581.800</td>
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</tr>
<tr>
<td>7</td>
<td>Red gram</td>
<td>3,000.00</td>
<td>1,899.85</td>
<td>3,120.00</td>
<td>634.07</td>
<td>3,716.50</td>
<td>452.6</td>
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<tr>
<td>8</td>
<td>Cowpea</td>
<td>594</td>
<td>693.67</td>
<td>632.5</td>
<td>636.57</td>
<td>735</td>
<td>625.4</td>
</tr>
<tr>
<td>9</td>
<td>Green gram</td>
<td>1,575.70</td>
<td>1,323.04</td>
<td>1702</td>
<td>10.247</td>
<td>1,498.50</td>
<td>256.4</td>
</tr>
<tr>
<td>10</td>
<td>Bengal gram</td>
<td>11,250.00</td>
<td>15,903.29</td>
<td>12,350.00</td>
<td>11,625.23</td>
<td>22,200.00</td>
<td>15,584.60</td>
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<tr>
<td>11</td>
<td>Black gram</td>
<td>610.5</td>
<td>49.102</td>
<td>660.5</td>
<td>36.415</td>
<td>576</td>
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<tr>
<td>Pulses Total</td>
<td>17,030.20</td>
<td>19,868.952</td>
<td>18,465.00</td>
<td>12,942.532</td>
<td>28,726.00</td>
<td>16,954.80</td>
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<tr>
<td>12</td>
<td>Groundnut</td>
<td>20,812.50</td>
<td>15,015.39</td>
<td>21,537.50</td>
<td>13,030.16</td>
<td>23,372.00</td>
<td>12,565.80</td>
</tr>
<tr>
<td>13</td>
<td>Safflower</td>
<td>150</td>
<td>60.44</td>
<td>165</td>
<td>0.275</td>
<td>318</td>
<td>0.54</td>
</tr>
<tr>
<td>14</td>
<td>Soybean</td>
<td>8,750.00</td>
<td>2,093.14</td>
<td>11,690.00</td>
<td>1,451.89</td>
<td>11,825.00</td>
<td>1,256.40</td>
</tr>
<tr>
<td>15</td>
<td>Sunflower</td>
<td>106.5</td>
<td>341.25</td>
<td>98.8</td>
<td>386.14</td>
<td>92.5</td>
<td>256.4</td>
</tr>
<tr>
<td>Oil Seeds Total</td>
<td>29,819.00</td>
<td>17,510.22</td>
<td>33,491.30</td>
<td>14,868.47</td>
<td>35,607.50</td>
<td>14,079.14</td>
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</tr>
<tr>
<td>Grand total</td>
<td>86,322.500</td>
<td>69,807.46</td>
<td>93,467.200</td>
<td>60,771.092</td>
<td>131,263.100</td>
<td>61,615.740</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Irrigation Development in Bijapur District

In Bijapur District the Gross irrigated area is 127674 hectares or about 27% total cropped area. The major sources of irrigation are canals, bore wells and open wells. In terms of groundwater availability and use, 23% of the area is considered safe, 36% critical or semi-critical and 41% over exploited. B.Bagewadi and Sindagi are the most over-exploited taluks. Groundwater levels are increased in some canal command areas.

**Table No. 4.7**

Area Irrigated by Different Sources in Bijapur District

<table>
<thead>
<tr>
<th>Taluks</th>
<th>Gross Irrigated Area</th>
<th>Net Irrigated Area</th>
<th>Gross Irrigated Area</th>
<th>Net Irrigated Area</th>
<th>Gross Irrigated Area</th>
<th>Net Irrigated Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Bagewadi</td>
<td>15357</td>
<td>10995</td>
<td>296</td>
<td>296</td>
<td>12558</td>
<td>11225</td>
</tr>
<tr>
<td>Bijapur</td>
<td>9753</td>
<td>8944</td>
<td>1103</td>
<td>1103</td>
<td>27023</td>
<td>23118</td>
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<tr>
<td>Indi</td>
<td>33855</td>
<td>28710</td>
<td>209</td>
<td>209</td>
<td>43163</td>
<td>38263</td>
</tr>
<tr>
<td>Muddebihal</td>
<td>12979</td>
<td>10833</td>
<td>72</td>
<td>72</td>
<td>5953</td>
<td>5251</td>
</tr>
<tr>
<td>Sindagi</td>
<td>55730</td>
<td>47480</td>
<td>228</td>
<td>228</td>
<td>21479</td>
<td>18658</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>127674</strong></td>
<td><strong>106962</strong></td>
<td><strong>1908</strong></td>
<td><strong>1908</strong></td>
<td><strong>110176</strong></td>
<td><strong>96515</strong></td>
</tr>
</tbody>
</table>

Source: Bijapur at a Glance 2011-12 P-98.
**Figure No. 4.9**
Area Irrigated by Different Sources in Bijapur District

**Figure No. 4.10**
Area Irrigated by Different Sources in Bijapur District
4.3.1 Cropping Pattern and Intensity in Bijapur District

Cropping intensity is depending on soil depth, cropping in Bijapur district can be either kharif (rainy season), Rabi (post-rainy season on residual moisture) or both (extended kharif). The net sown area in Bijapur is 872,000 ha and the area sown more than once 193,000 ha giving a cropping intensity of 122 %. The major field crops cultivated red gram, sunflower and pearl millet in the kharif and sorghum, sunflower and chickpea in the Rabi. Yields of rain fed crops are low. The area under maize is increasing under irrigation and this associated with very high yield relative to their staple cereals in terms of production, maize and pearl millet is the dominant crops.

4.3.2 Conclusion

By knowing above the chapter in an Indian economy where more than fifty six percent of the population is depended on agriculture and about twenty six percent of the national assumes greater importance. The ever-increasing population on the one hand and the progressively shrinking per capita agricultural land availability of cropping system this possible mainly through the expansion of irrigation on facilities

The government of India and state governments are spending crores of rupees for creating irrigation facility through developing major, medium and minor irrigation projects, ever since the launching of the first Five Year Plan in 1950-51. The growth of irrigation under various sources in the Karnataka state, it was fund that total gross irrigated from different sources grew at the rate of 13062 hectares in Karnataka state as a whole. Among the Bijapur district significant positive improvement is there in the irrigation development.
References


9. [http://des.kar.nic.in/ecsurvey0910/Chapter4-2009-10(Eng).pdf accessed on 31 October 2011](http://des.kar.nic.in/ecsurvey0910/Chapter4-2009-10(Eng).pdf)


